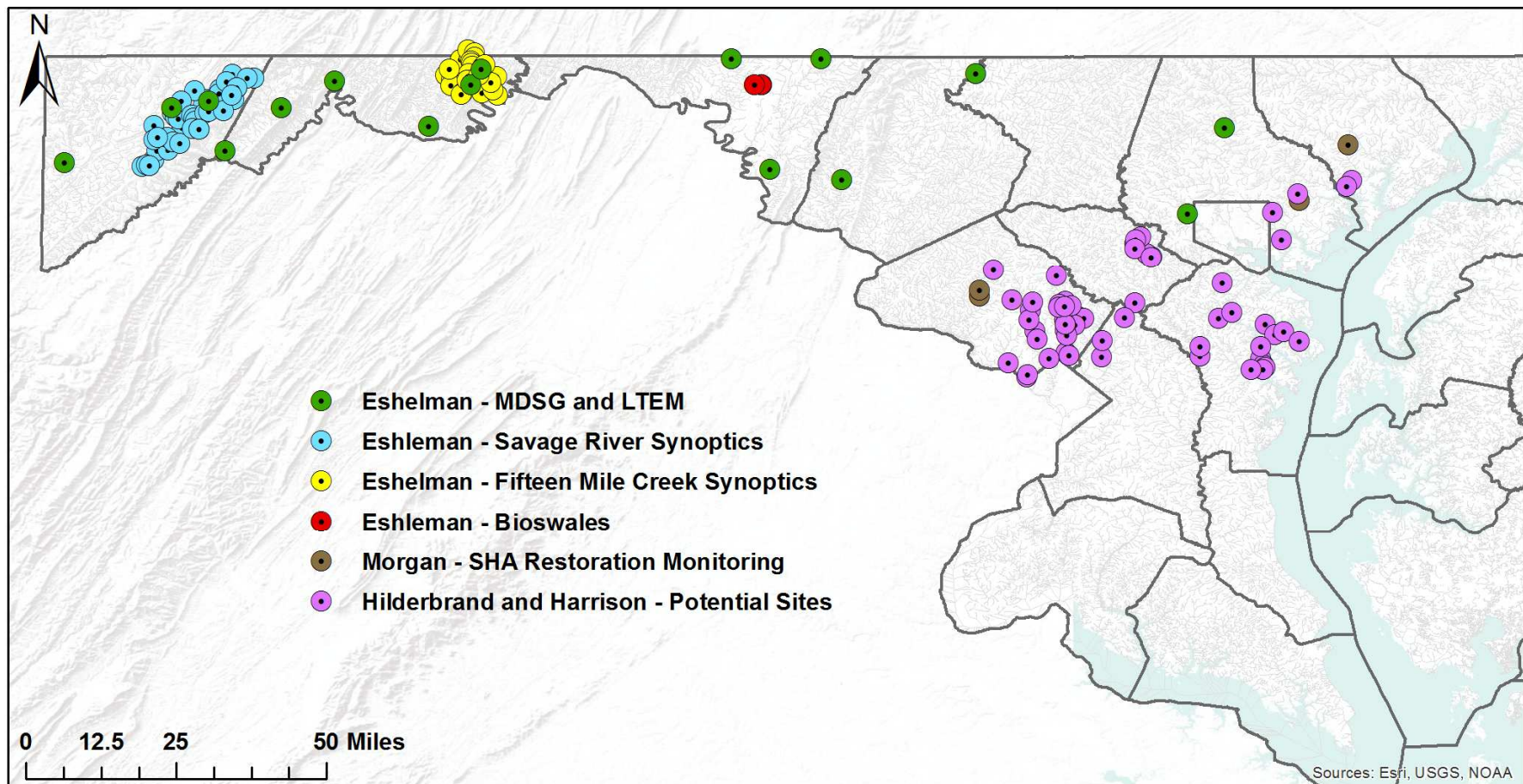


2016 Stream Monitoring at UMCES Appalachian Laboratory

Ian Smith and Steve Harrison

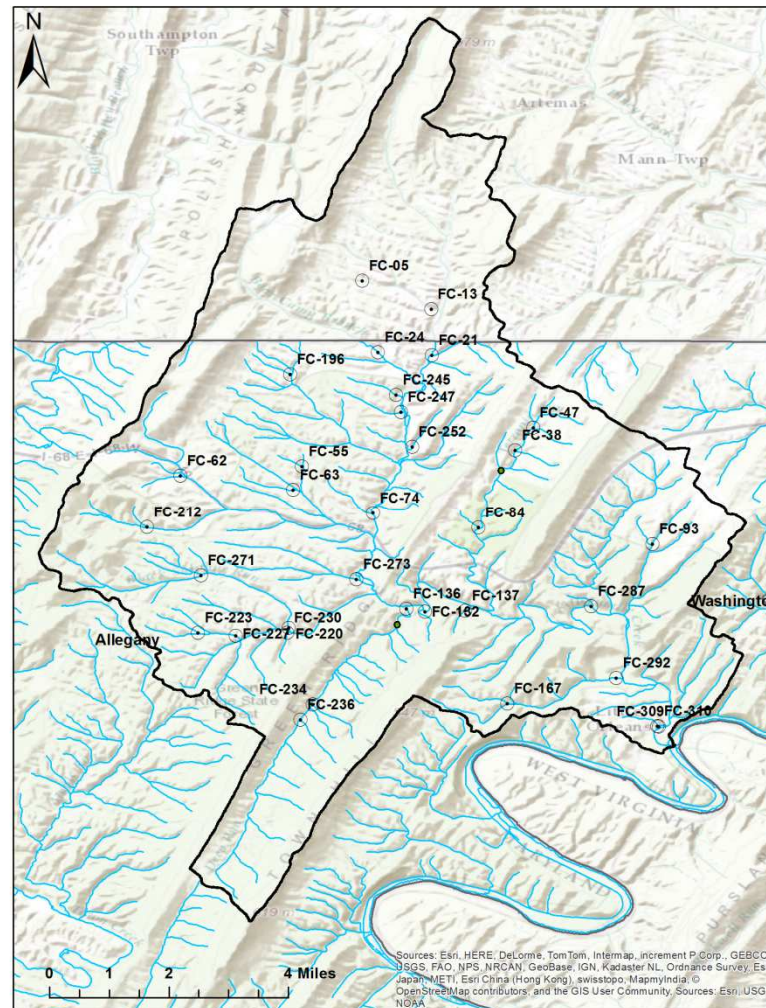




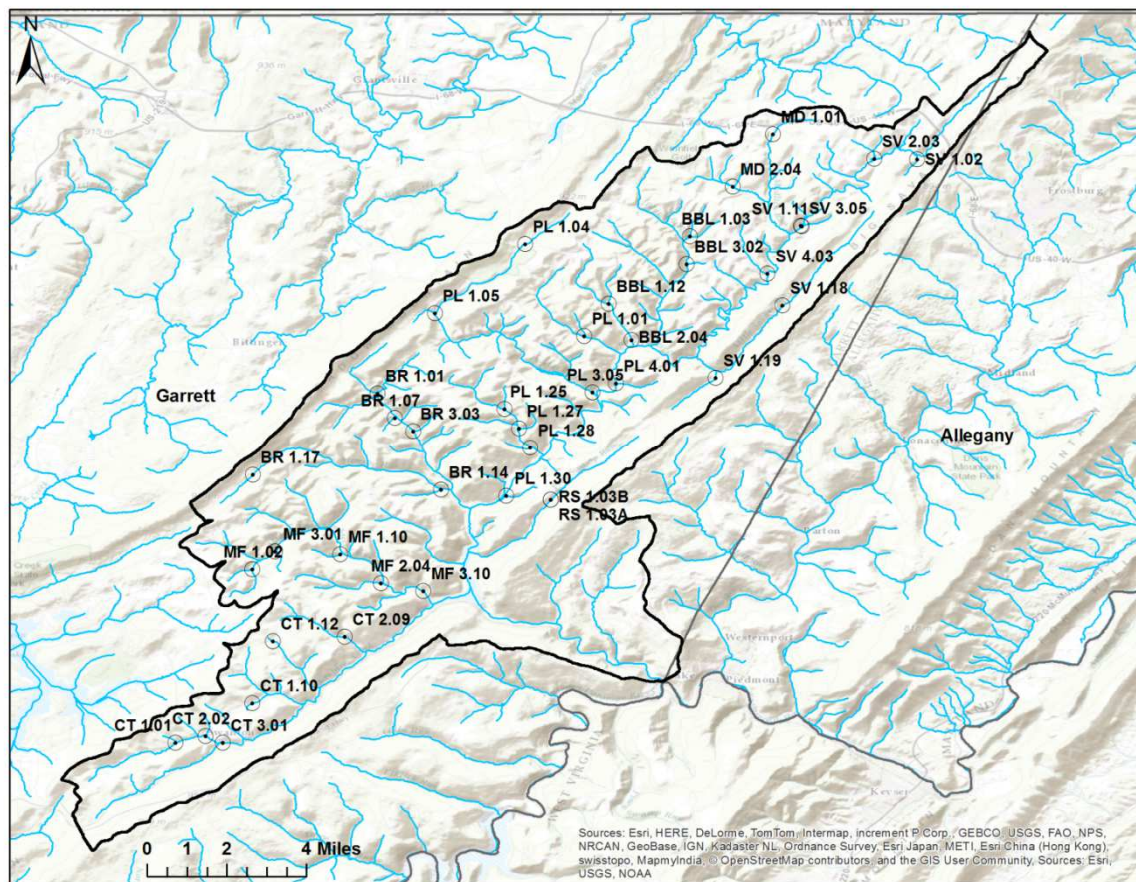
Synoptic Surveys

- Long-term monitoring of stream chemistry in the Fifteen Mile Creek and Savage River watersheds.
- Samples analyzed for TDN, Anions, Cations, Inorganic Nutrients and DOC
- No Biological sampling conducted

Fifteen Mile Creek Sites



Savage River Sites





MdSG and LTEM

- Maryland Sea Grant research with DNR looking at atmospheric nitrate deposition
- 14 Sites (4 non-core)
- O17, O18 and N15 Isotope Analysis
- Potential archival analysis
- Long-term stream monitoring
- 6 Sites
- Monthly and storm sampling
- Flow, TSS/TDS, Anions, Cations, Inorganic nutrients, TDN, DOC, Acid-base chemistry

Wills Creek

Town Creek

Georges Creek

Conococheague Creek

Antietam Creek (Upper and Lower)

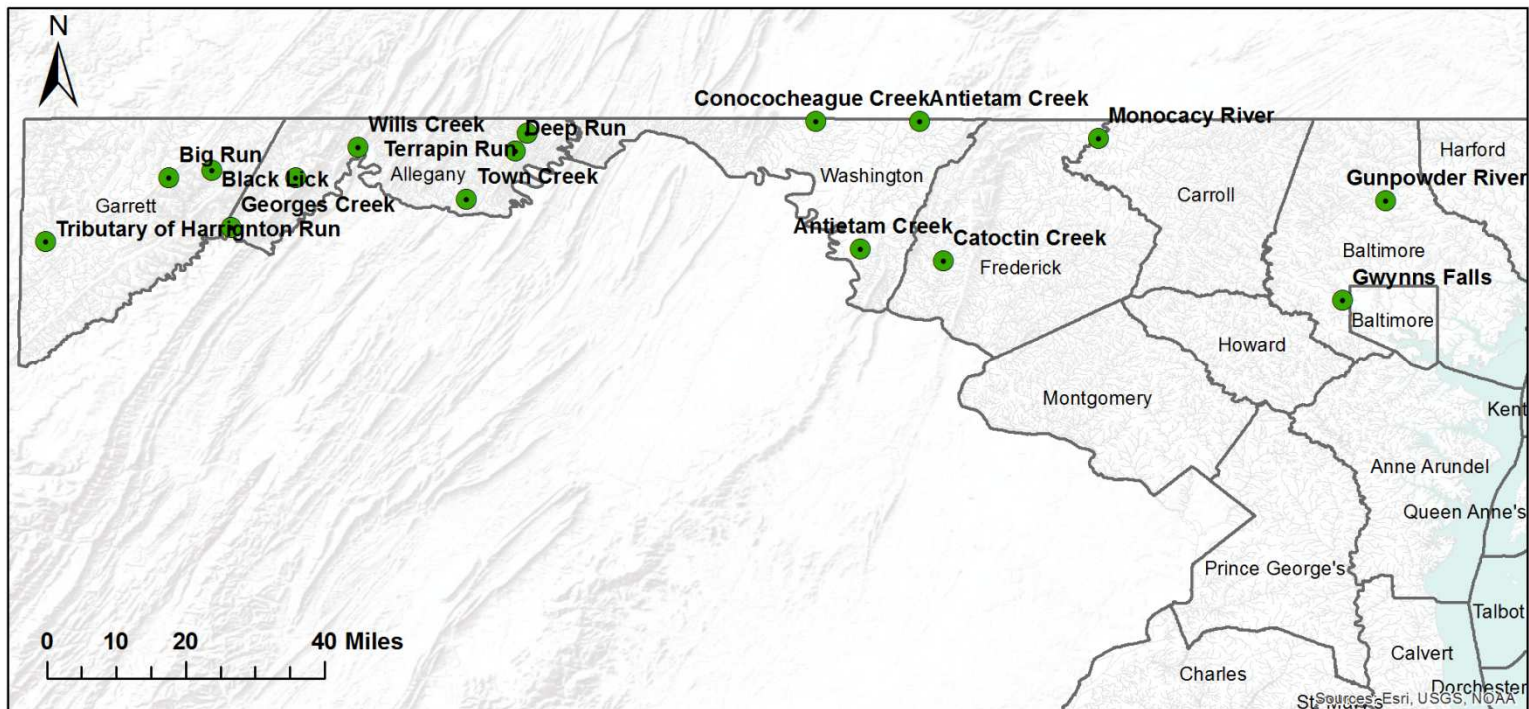
Monocacy River

Catoctin Creek

Gunpowder Falls

Gwynns Falls

MdSG/LTEM Sites

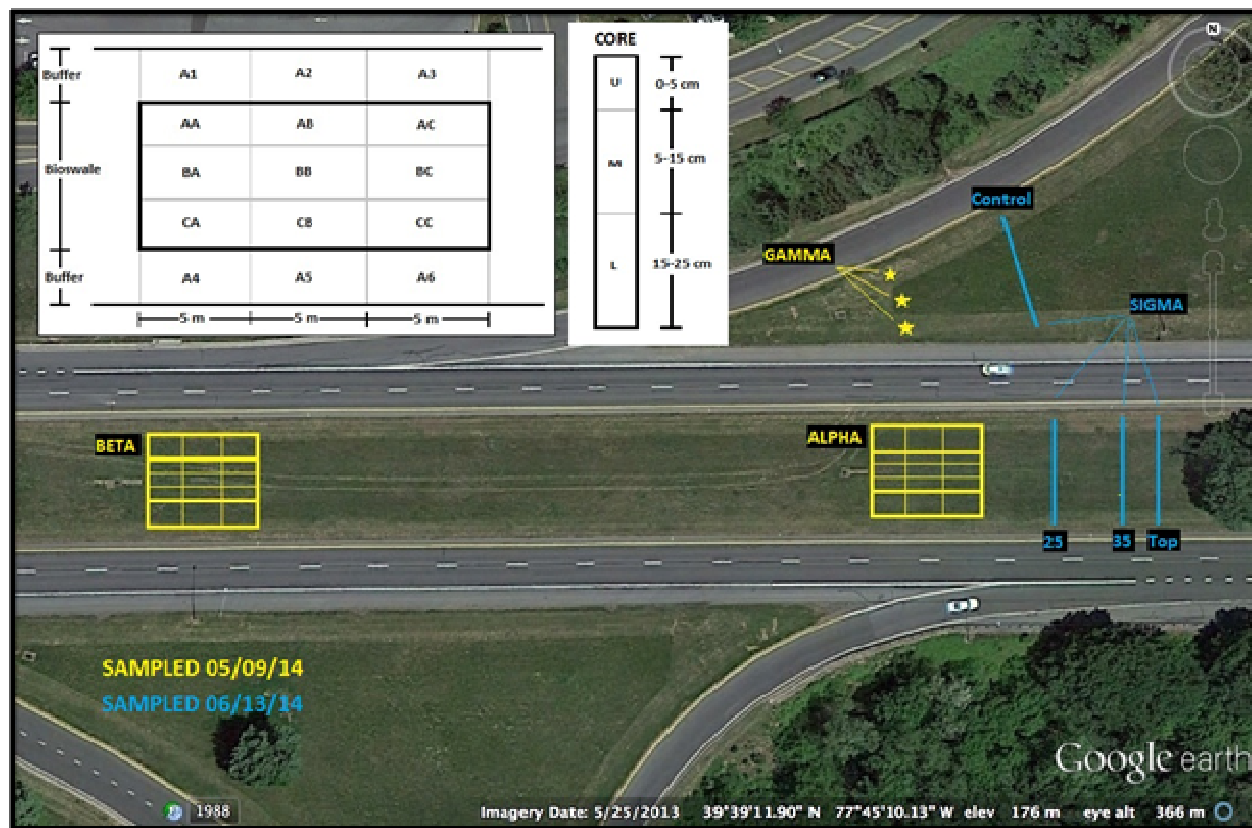




SHA Bioswales

- Hydrology and water chemistry analysis of bioswale performance
- TSS, Anions, Inorganic nutrients and metals
- Surface and subsurface hydrology
- Rainfall and temperature
- Soil chemistry, physical analysis, and infiltration

Hagerstown Bioswales

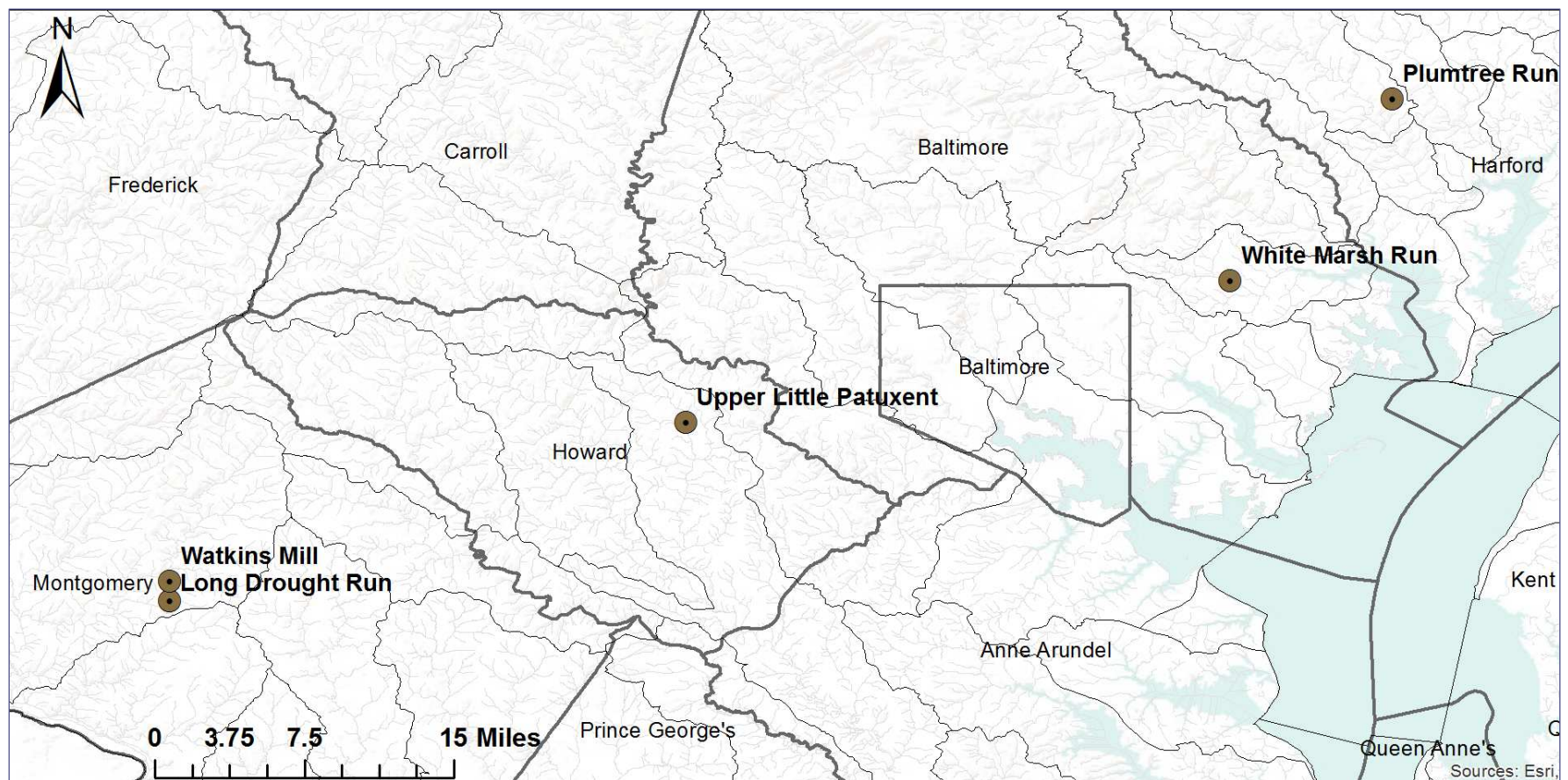




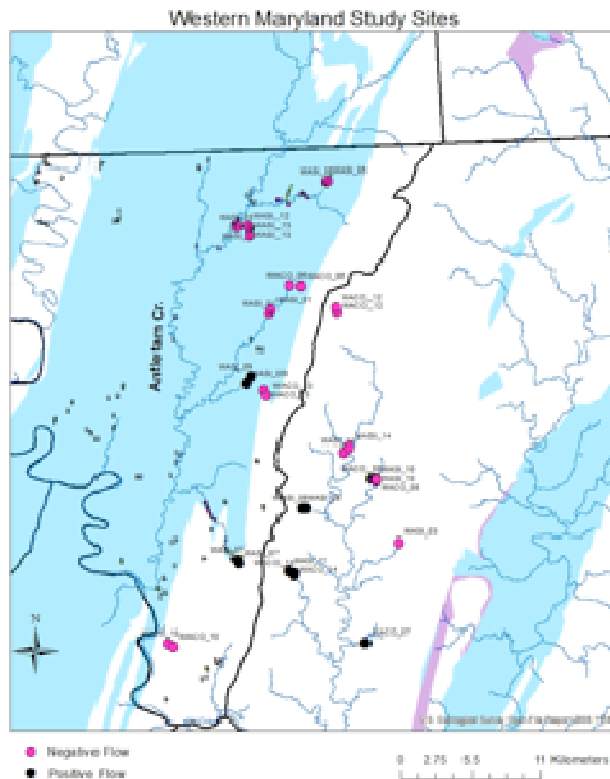
SHA Stream Restoration

- Pre- and post- State Highway stream restoration benthic and chemistry monitoring
- Benthic macroinvertebrate sampling (two within, two-four controls)
- TSS, TN, TP, Inorganic nutrients, DOC, Metals, Acid-base chemistry, SpCd*

SHA - SR Sites



Antietam & Catoctin Watersheds



- 30 Sites in Antietam
- Catoctin Comparisons
- 4 continuous gauge height, SpCd, temp
- Cations, Anions, Nutrients
- Chlorine tracer
- Tritium



Potential Additional Sites

- Piedmont site for Bioswales (US 15, 340,etc)
- Shenandoah Synoptics (Paine Run)
- SHA Stream Restoration Benthics and Chemistry
- Georges Creek Survey

Quantifying the ecological uplift and effectiveness of differing stream restoration approaches in Maryland

Steve Harrison

Project Background



- Chesapeake Bay Trust, MD DNR, USEPA
-Restoration Research Grant Program
- Goal: Answer key restoration questions to benefit stream restoration process.
-ex: What are optimal site conditions for particular techniques and how can we raise our confidence in proposed restoration project outcomes?
- Topic: Effectiveness of certain project types in certain site characteristics, resources invested to have most impact





Our Goals:

- Assess how restoration induced change in an urban stream's physical attributes affect stream ecosystem structure and function
 - structure by MBSS BIBI, function by wsm
- Estimating uplifts across diff. approaches, age, land use, and drainage area
 - Maximal, Potential, Realized to identify realistic restoration goals
- Estimate N and P export by adult aquatic insects based on instream larval biomass



Study Design

- 20 urban stream restorations in Coastal Plain and 20 in Piedmont
 - triplicate design

Issues:

- restoration length and distance between reaches
- confluences
- may have to use bootstrapping approach if no upstream available
- unrestored control streams/reaches of similar land use and basin area
- Any leads would be beneficial and appreciated - sharrison@umces.edu

Potential Sites

